

FIG. 10

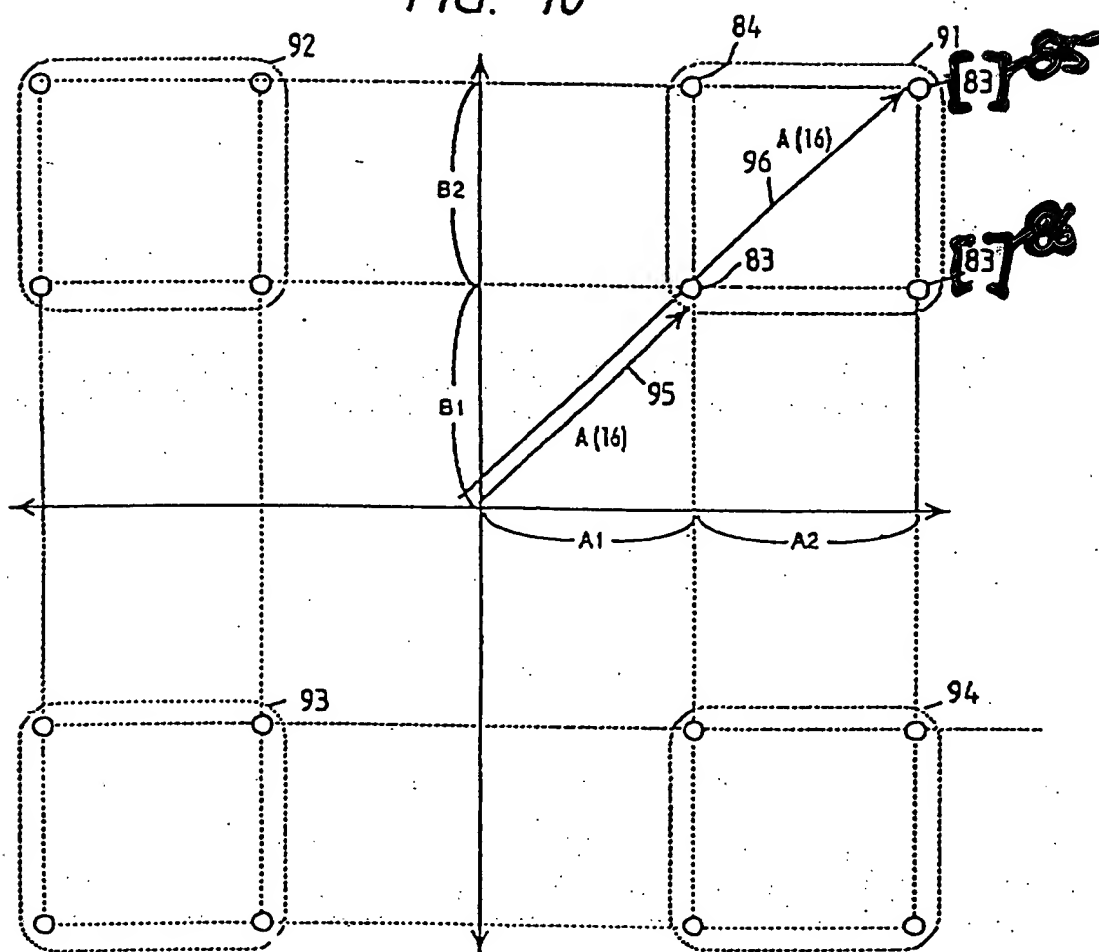


FIG. 17

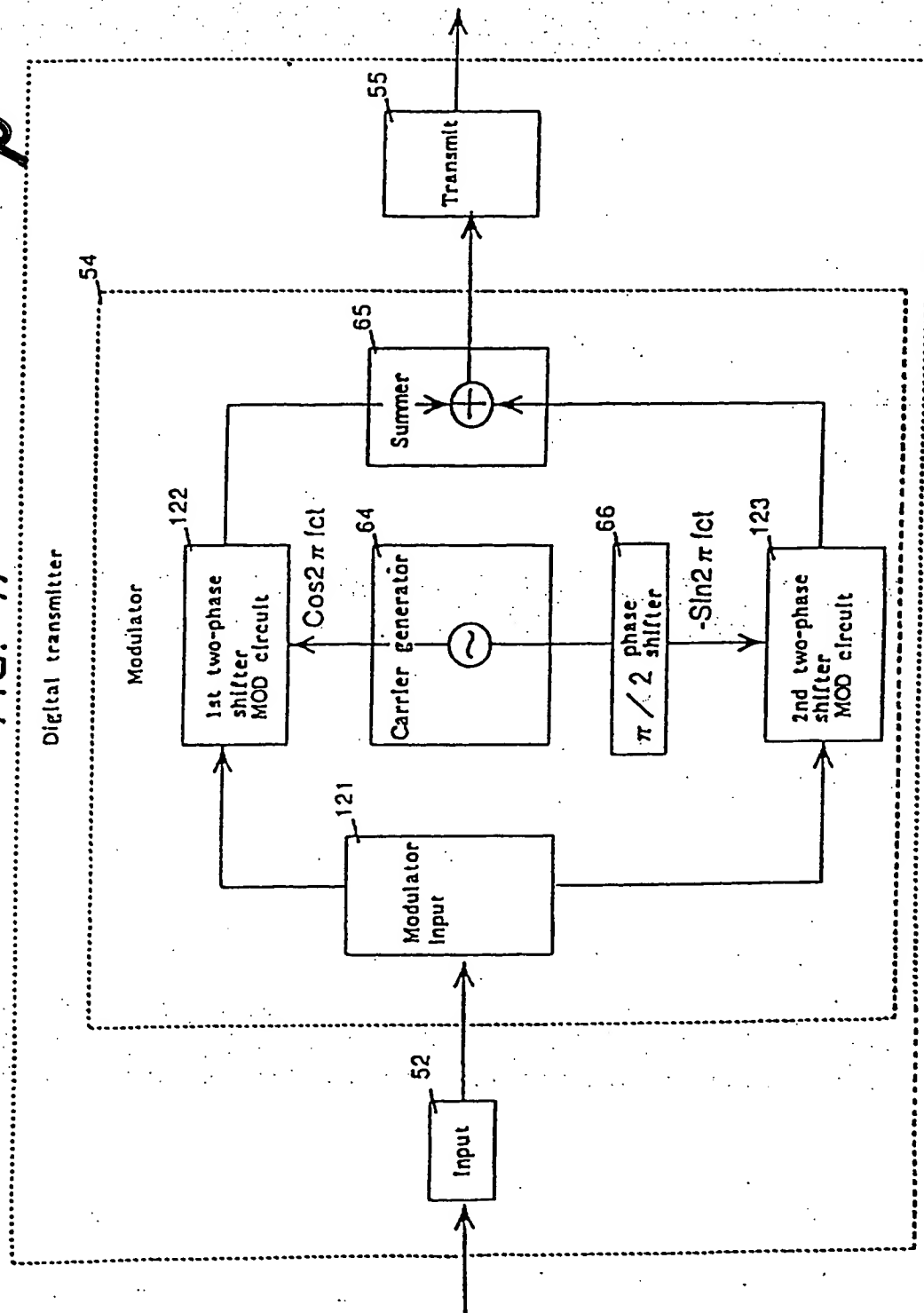
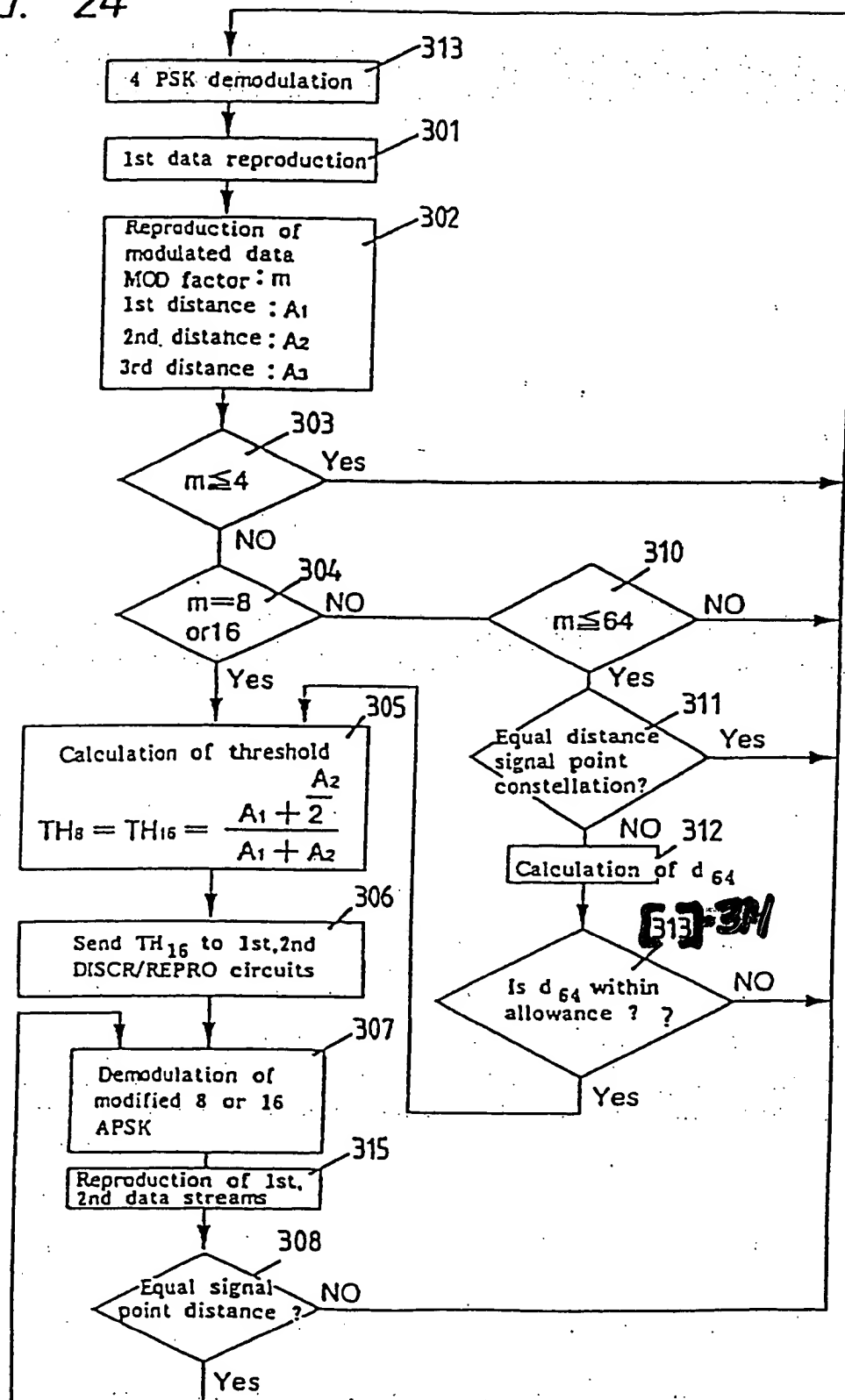


FIG. 24



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graph TD
    313[4 PSK demodulation] --> 301[1st data reproduction]
    301 --> 302[Reproduction of modulated data  
MOD factor: m  
1st distance: A1  
2nd distance: A2  
3rd distance: A3]
    302 --> 303{m ≤ 4}
    303 -- Yes --> 308{Is error rate low?}
    303 -- No --> 304{m = 8 or 16}
    304 -- Yes --> 305[Calculation of threshold  
TH8 = TH16 = (A1+2A2)/(A1+A2)]
    305 --> 306[Send TH16 to 1st, 2nd DISCR/REPRO circuits]
    306 --> 307[Demodulation of modified 8 or 16 APSK]
    307 --> 315[Reproduction of 1st, 2nd data streams]
    315 --> 308
    308 -- Yes --> 313
    308 -- No --> 320{m = 32?}
    320 -- Yes --> 332[Demodulation of 32]
    332 --> 307
    320 -- No --> 321{m = 64?}
    321 -- Yes --> 323{APSK is A more than setting?}
    323 -- Yes --> 324[Calculation of threshold  
TH164 = (A1+2A2)/(A1+A2)  
TH264 = (A1+2A2)/(A1+A2)  
TH364 = (A1+A2-2A3)/(A1+A2)]
    324 --> 325[Send threshold values to 1st, 2nd DISCR/REPRO circuits]
    325 --> 326[Demodulation of modified 64 APSK]
    326 --> 327[Reproduction of 1st, 2nd, 3rd data streams]
    327 --> 328{Is error rate low?}
    328 -- Yes --> 313
    328 -- No --> 302
  
```

The flowchart illustrates a data reproduction system with feedback loops for error rate monitoring and threshold calculation. The process begins with 4 PSK demodulation (313), leading to 1st data reproduction (301) and then to the reproduction of modulated data (302). A decision diamond (303) checks if the modulation order  $m \leq 4$ . If Yes, it proceeds to a decision diamond (308) to check if the error rate is low. If Yes, it loops back to 4 PSK demodulation (313). If No, it proceeds to a decision diamond (304) to check if  $m = 8$  or  $16$ . If Yes, it calculates a threshold (305) using the formula  $TH_8 = TH_{16} = \frac{A_1 + 2A_2}{A_1 + A_2}$ , sends it to the 1st and 2nd DISCR/REPRO circuits (306), and then proceeds to demodulation of modified 8 or 16 APSK (307). If No, it proceeds to a decision diamond (320) to check if  $m = 32$ . If Yes, it proceeds to demodulation of 32 (332), which then feeds into the demodulation of modified 8 or 16 APSK (307). If No, it proceeds to a decision diamond (321) to check if  $m = 64$ . If Yes, it checks if APSK is A more than setting? (323). If Yes, it calculates a threshold (324) using the formulas  $TH_{164} = \frac{A_1 + 2A_2}{A_1 + A_2}$ ,  $TH_{264} = \frac{A_1 + 2A_2}{A_1 + A_2}$ , and  $TH_{364} = \frac{A_1 + A_2 - 2A_3}{A_1 + A_2}$ . It then sends these threshold values to the 1st and 2nd DISCR/REPRO circuits (325), proceeds to demodulation of modified 64 APSK (326), and then to the reproduction of 1st, 2nd, and 3rd data streams (327). A final decision diamond (328) checks if the error rate is low. If Yes, it loops back to 4 PSK demodulation (313). If No, it loops back to the reproduction of modulated data (302).

FIG. 29

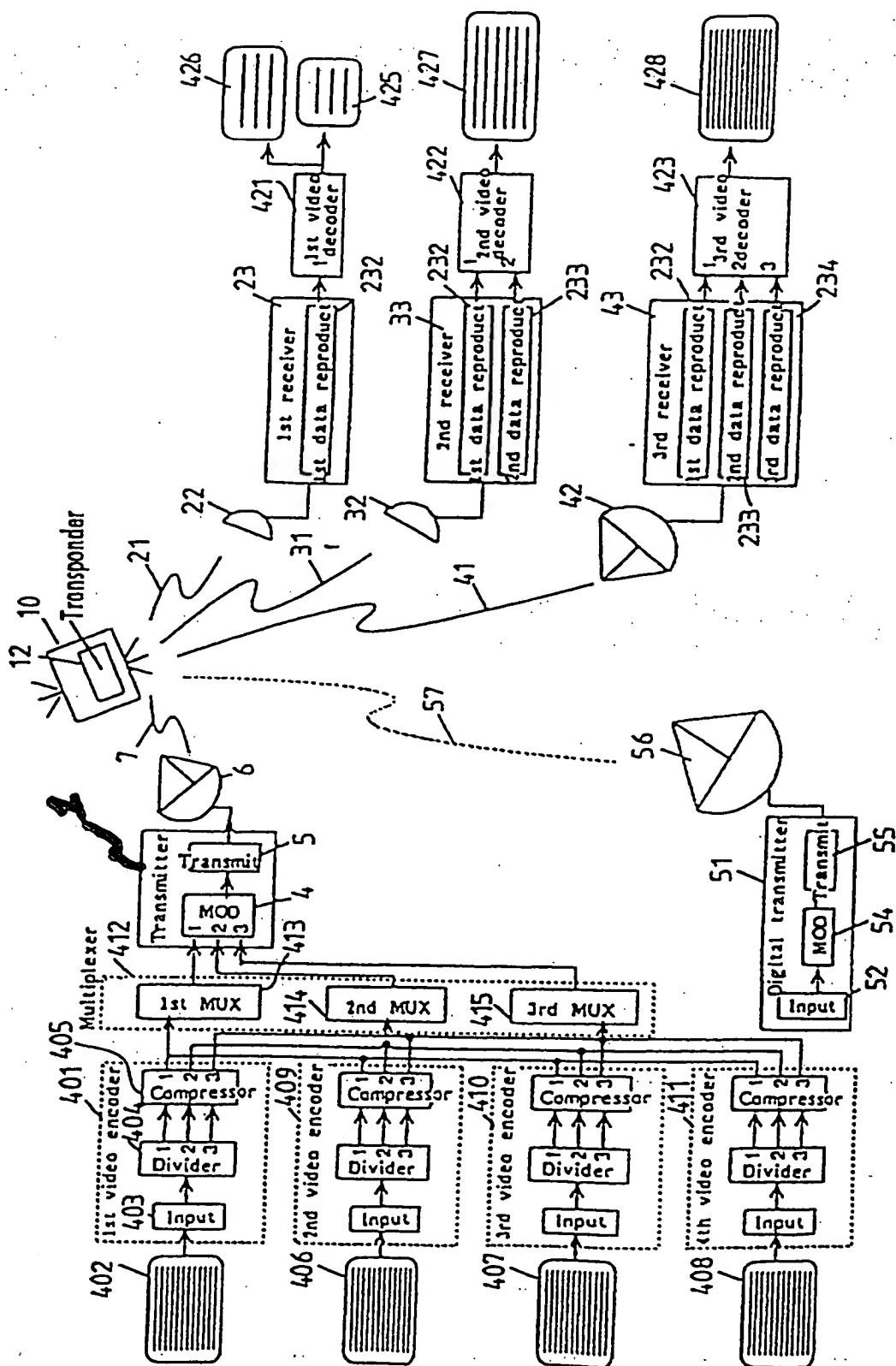


FIG. 30

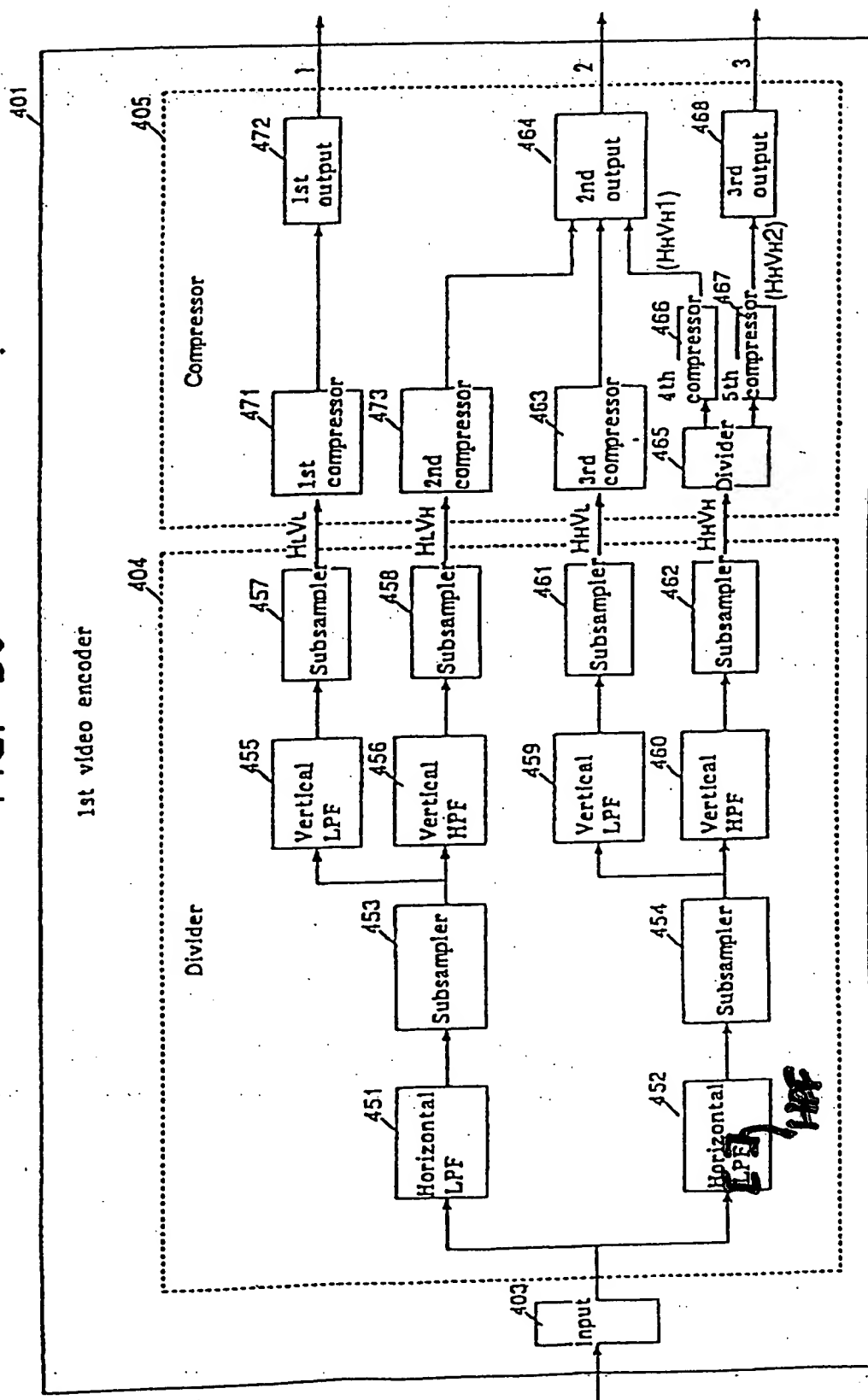


FIG. 32

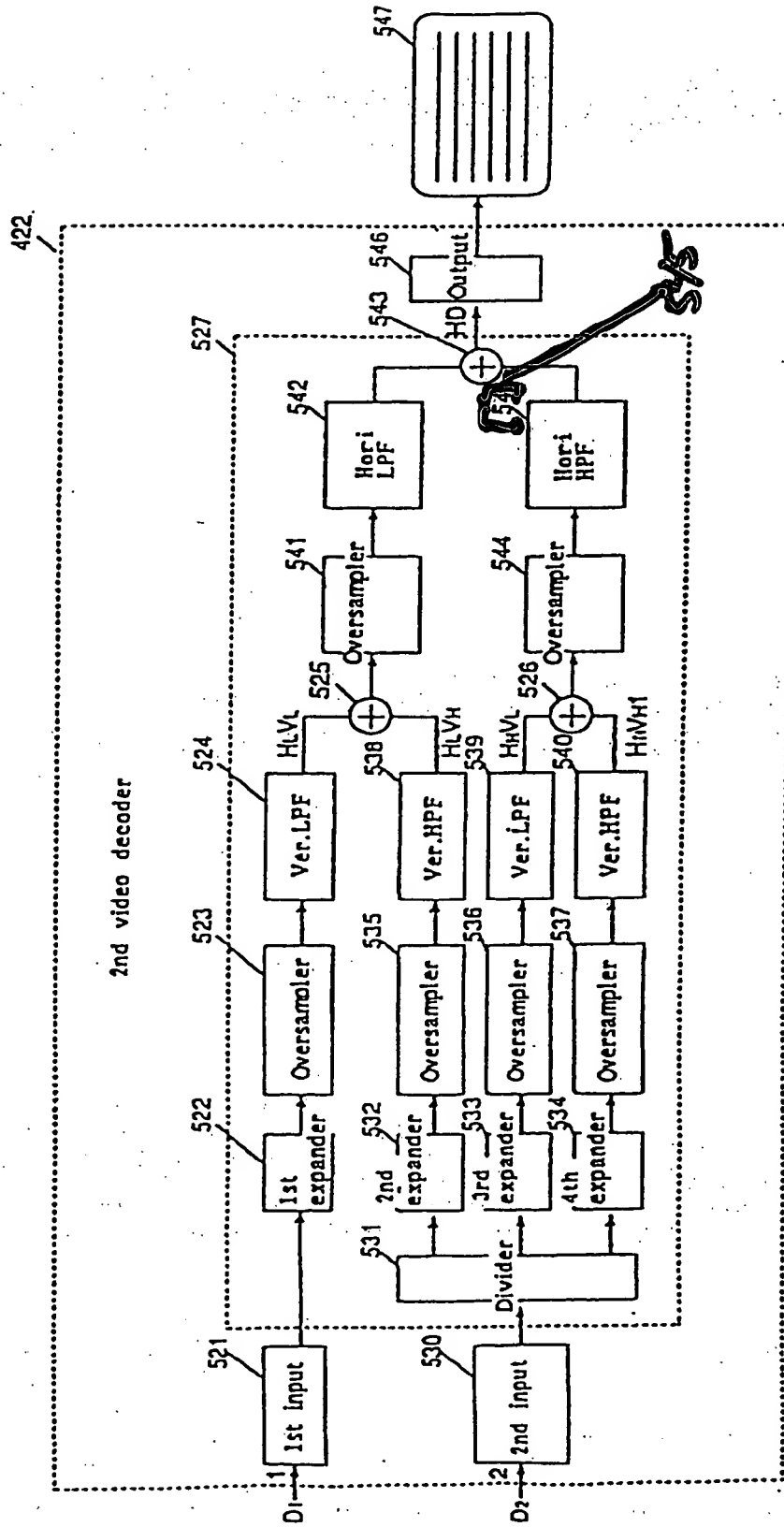


FIG. 41

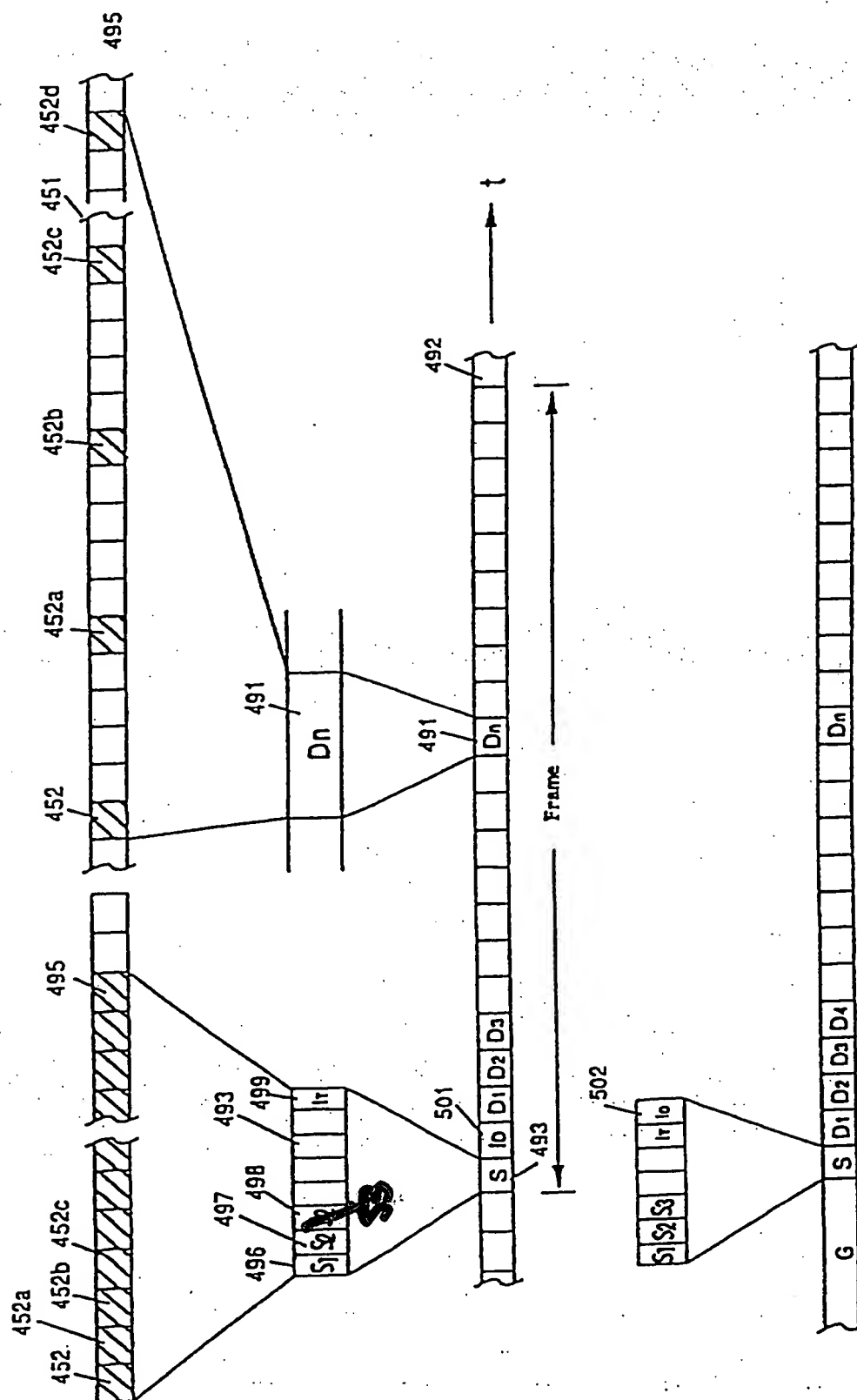






FIG. 48

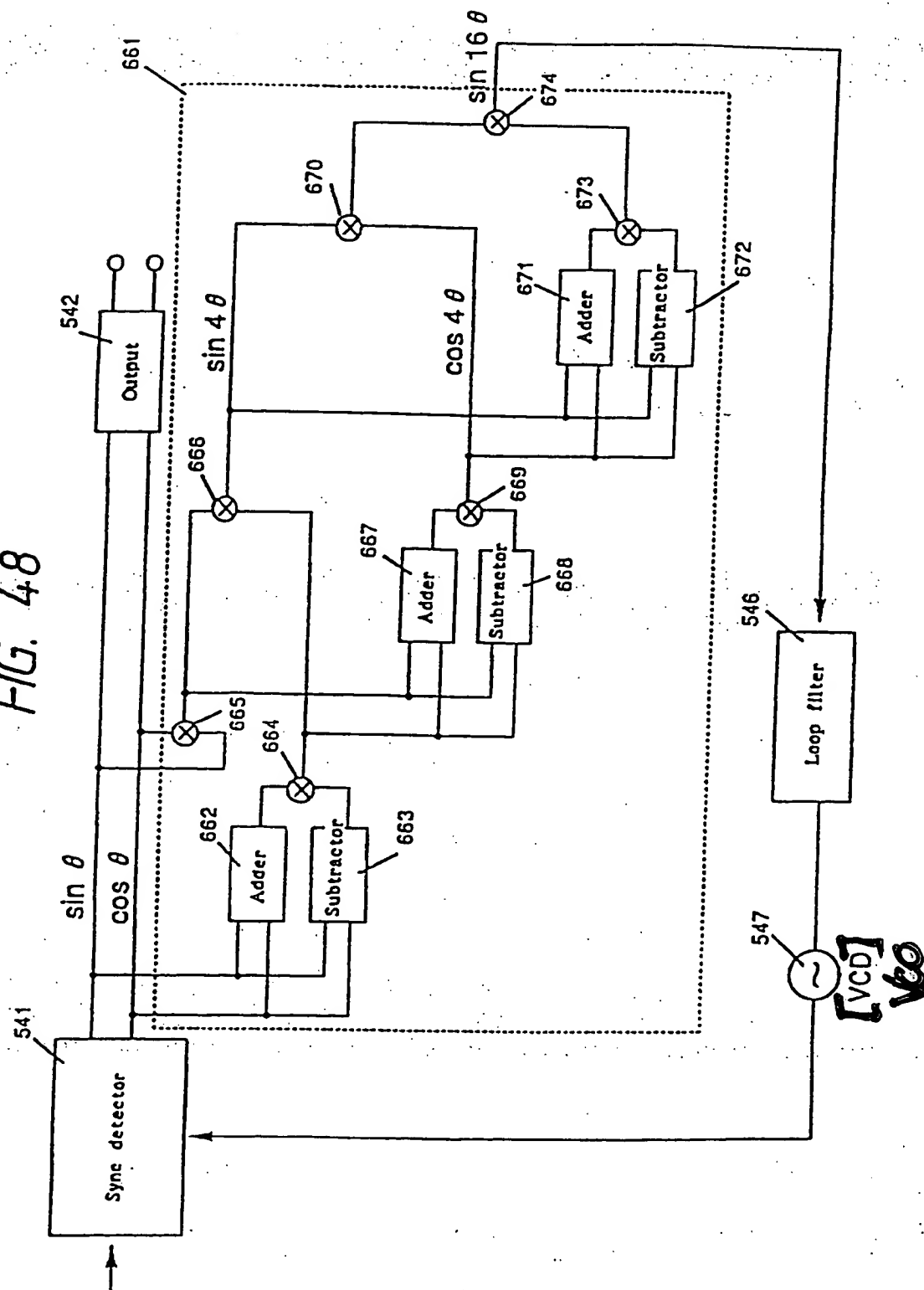




FIG. 65

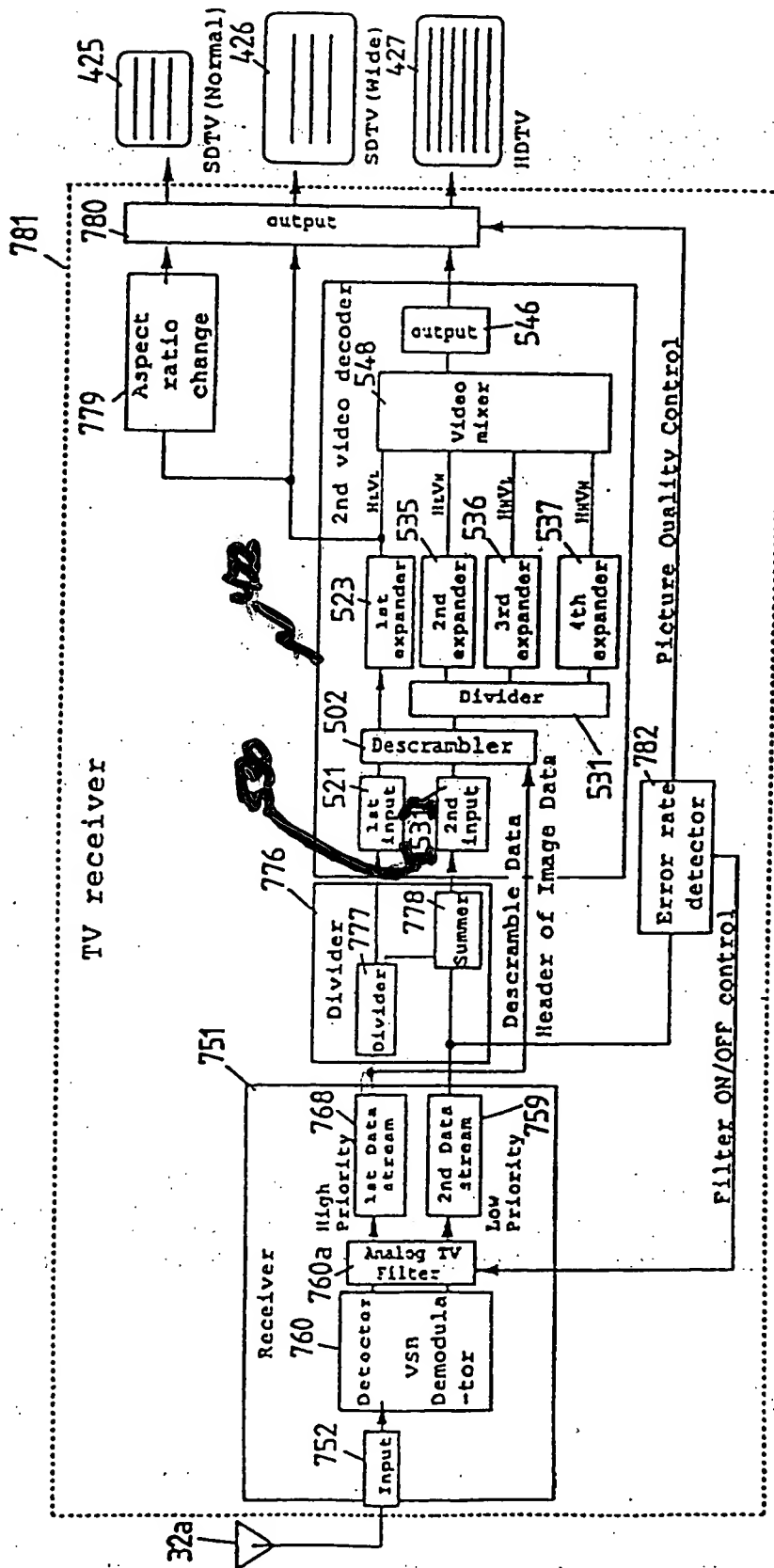
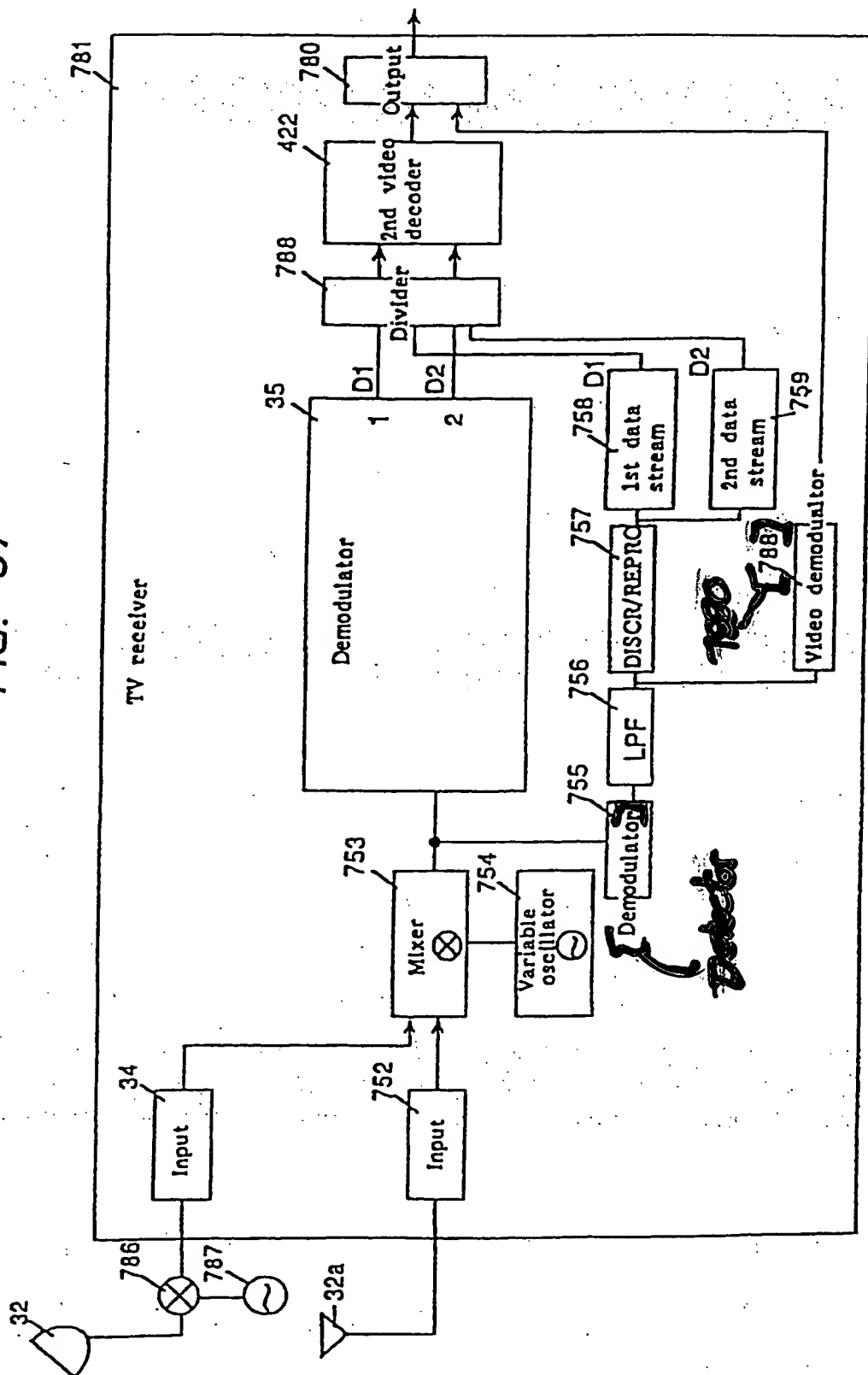


FIG. 67



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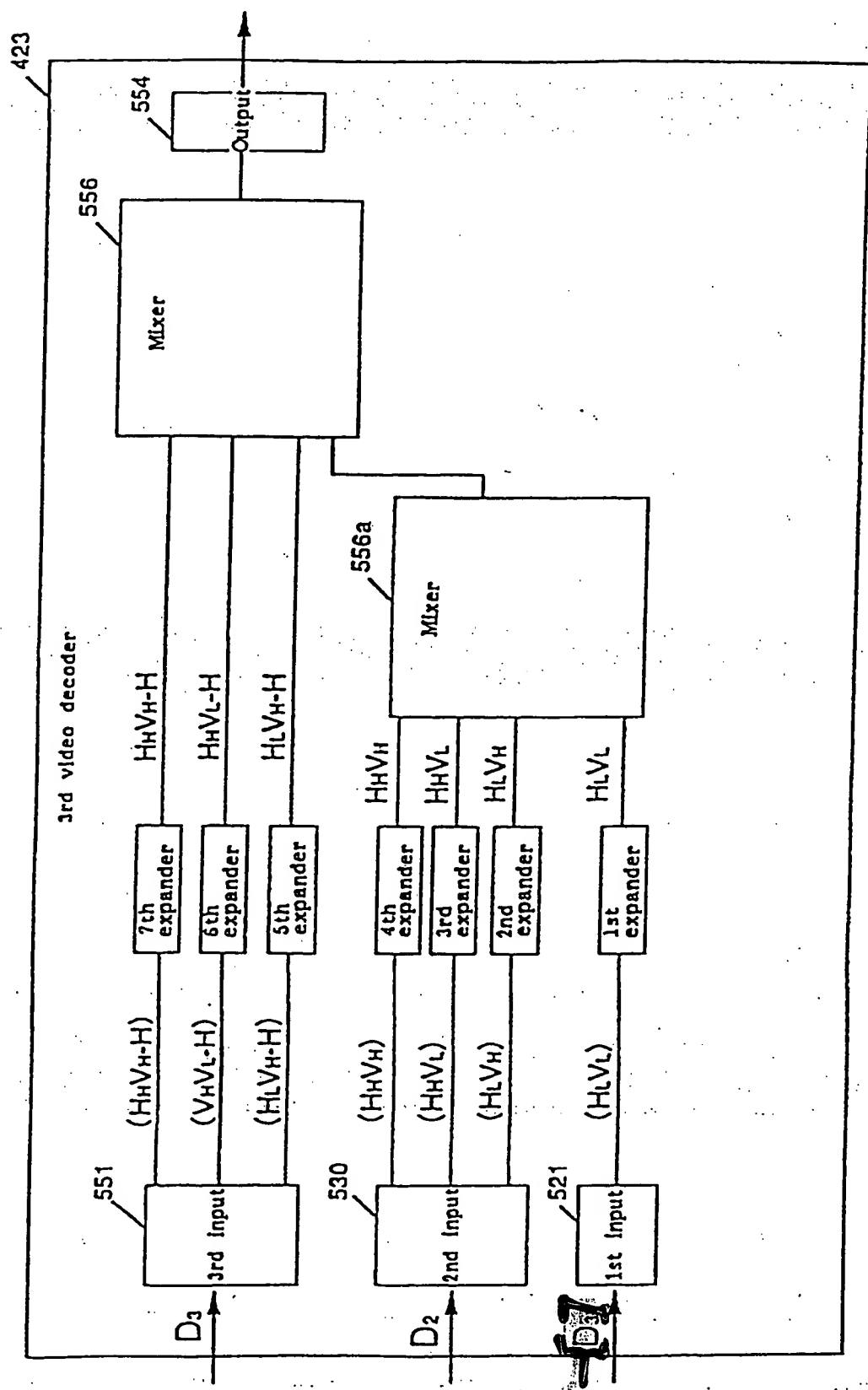
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FIG. 71



~~D1-D2~~

FIG. 72

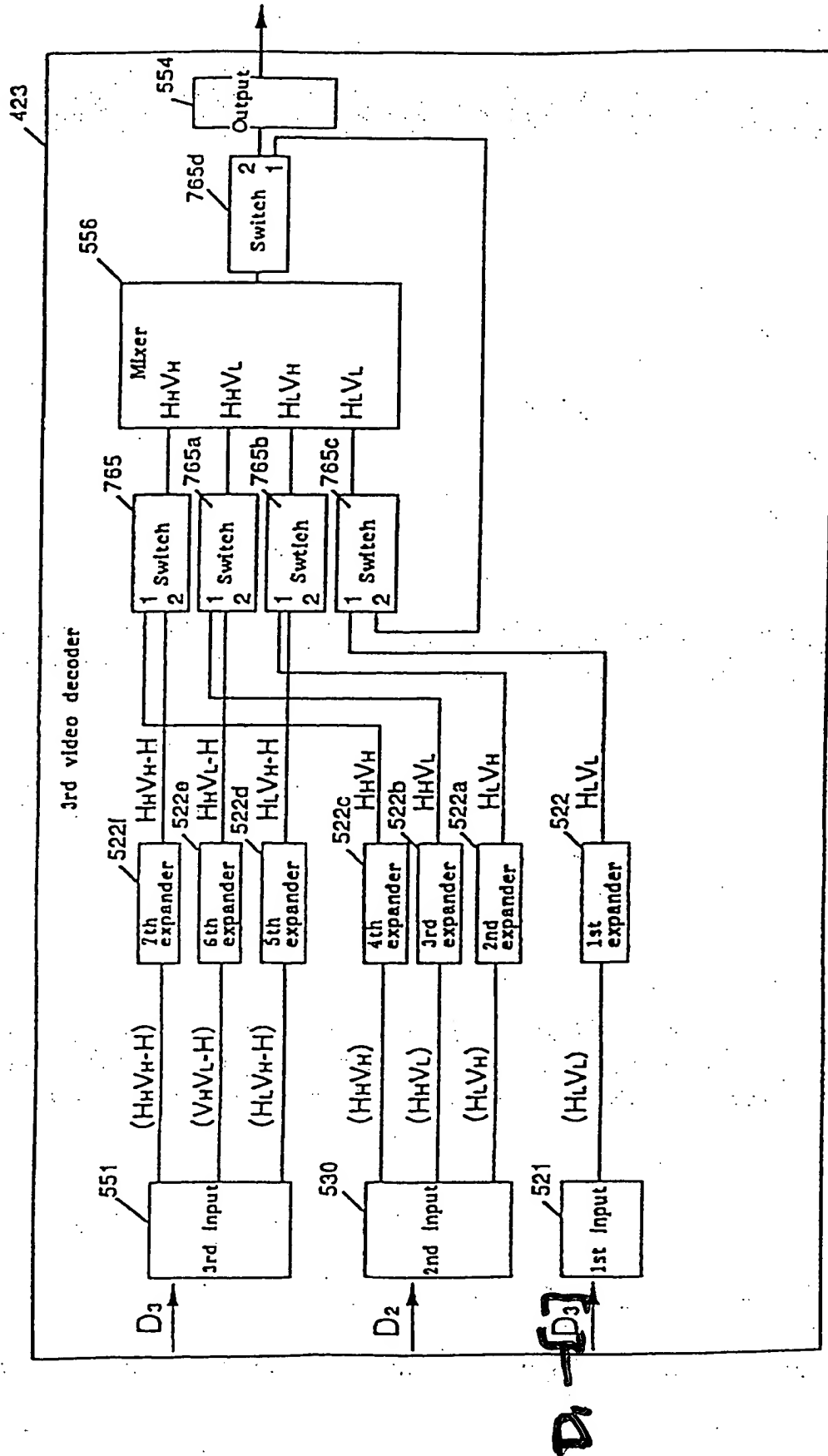
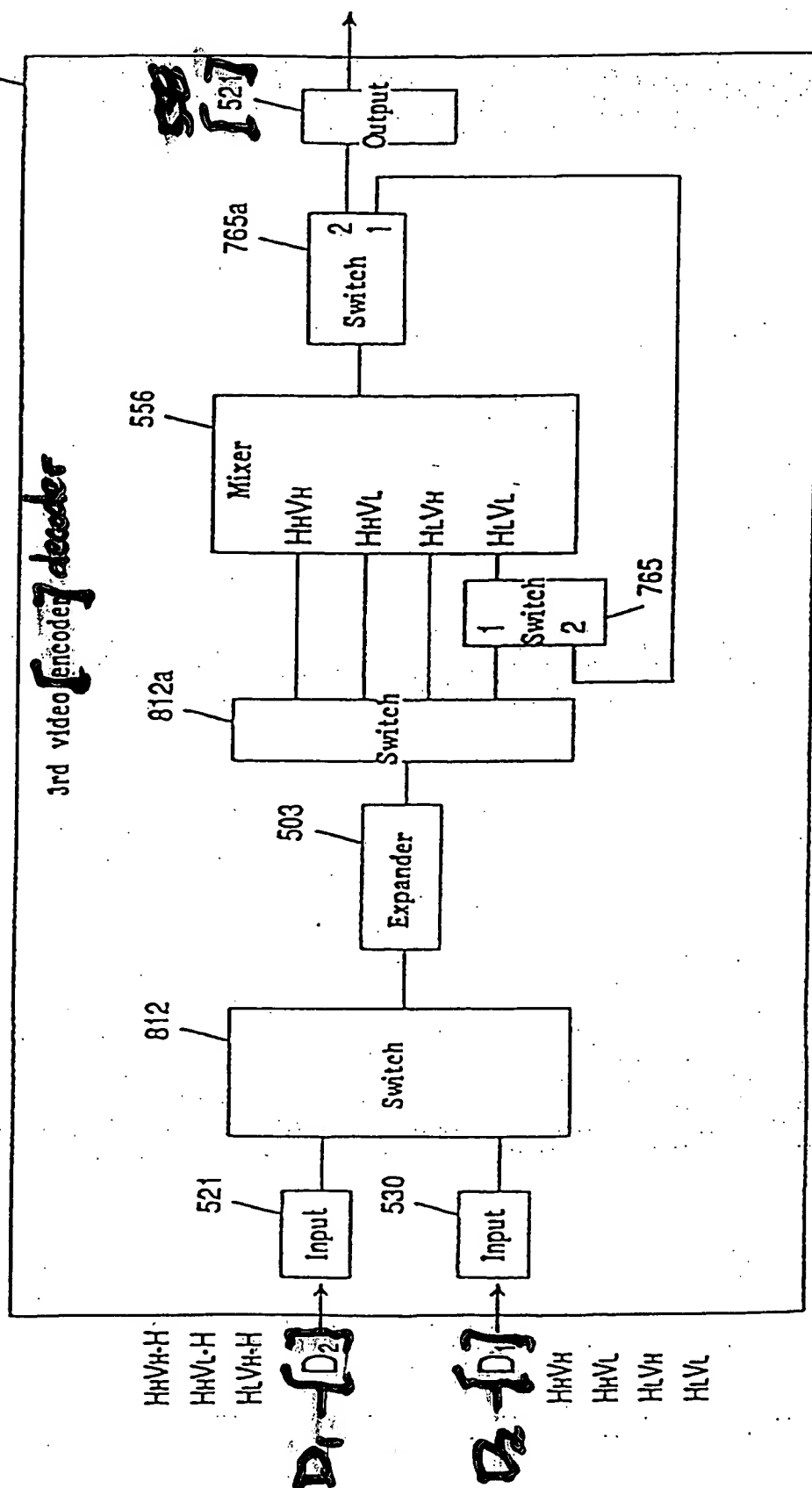




FIG. 78



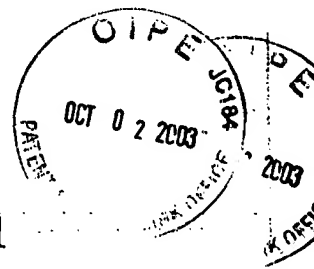


FIG. 80

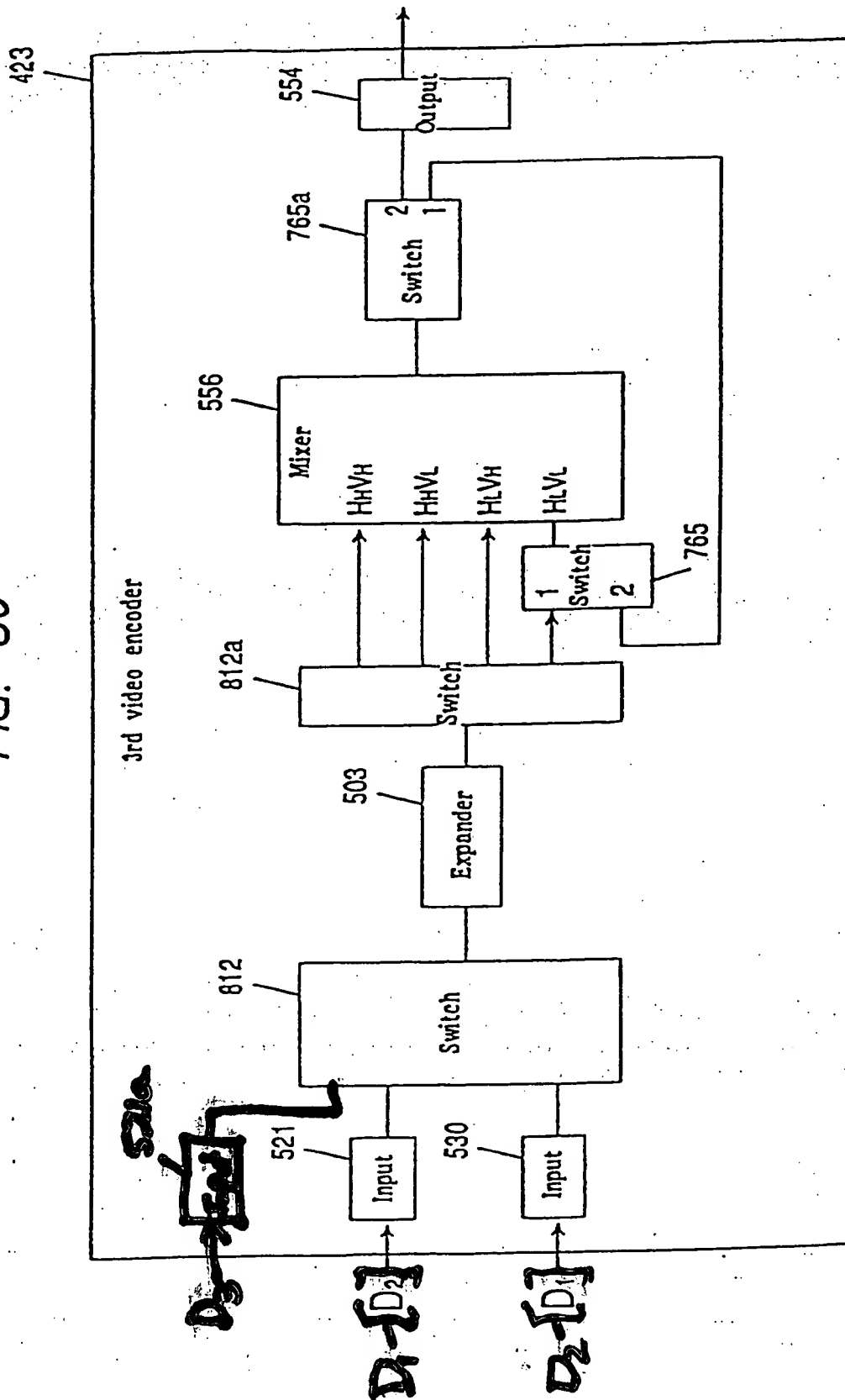




FIG. 82

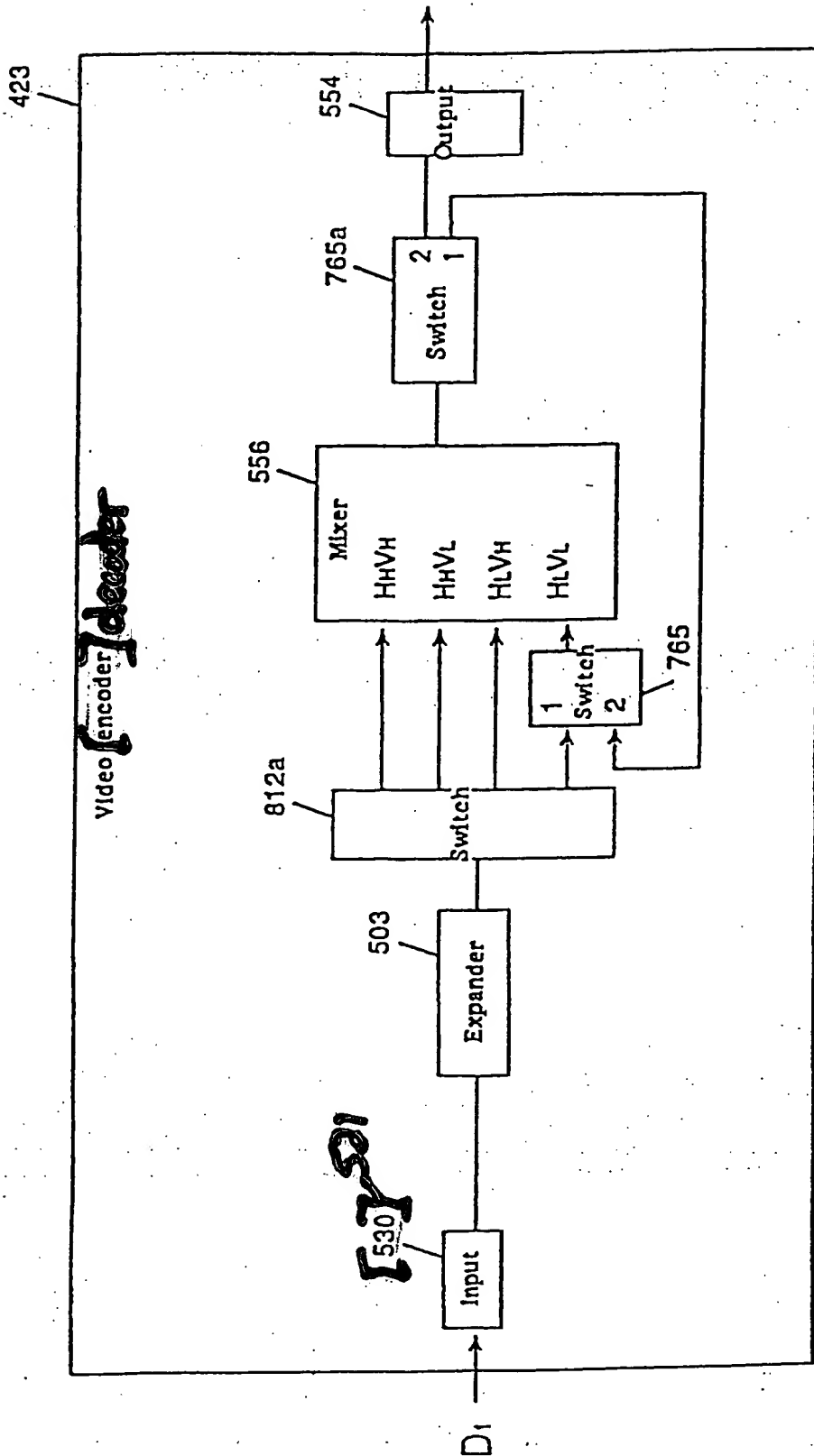




FIG. 93

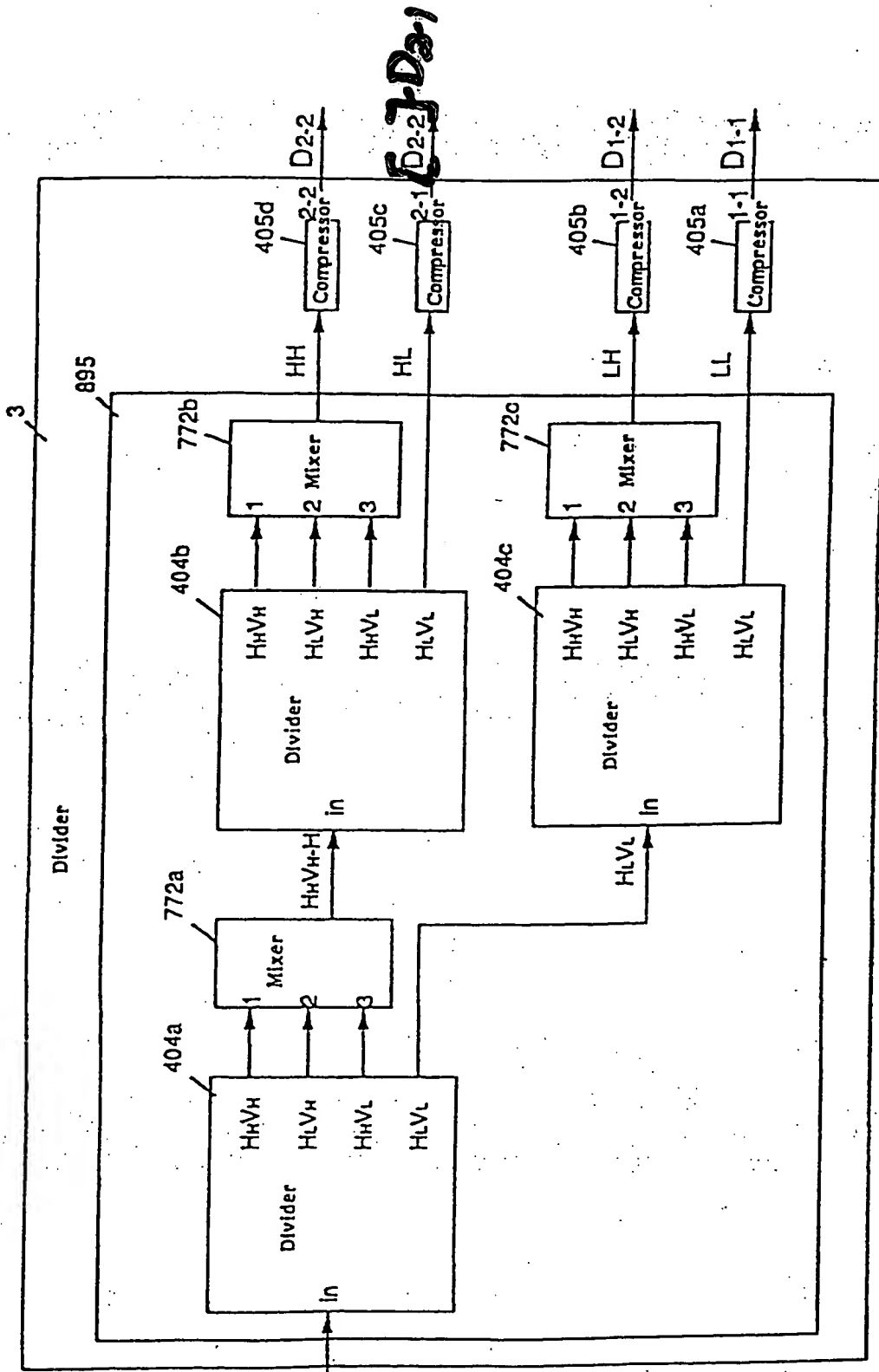


FIG. 124

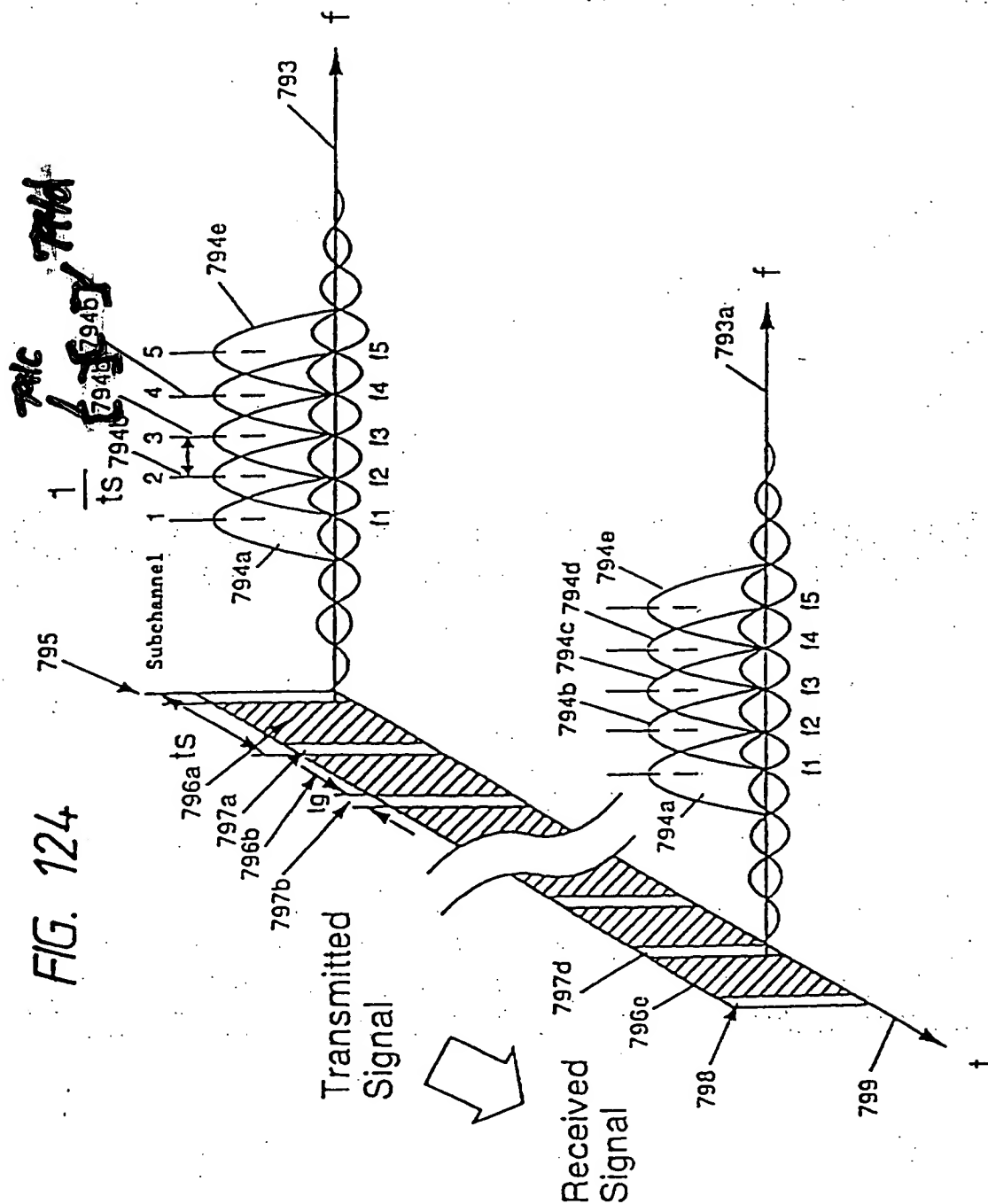
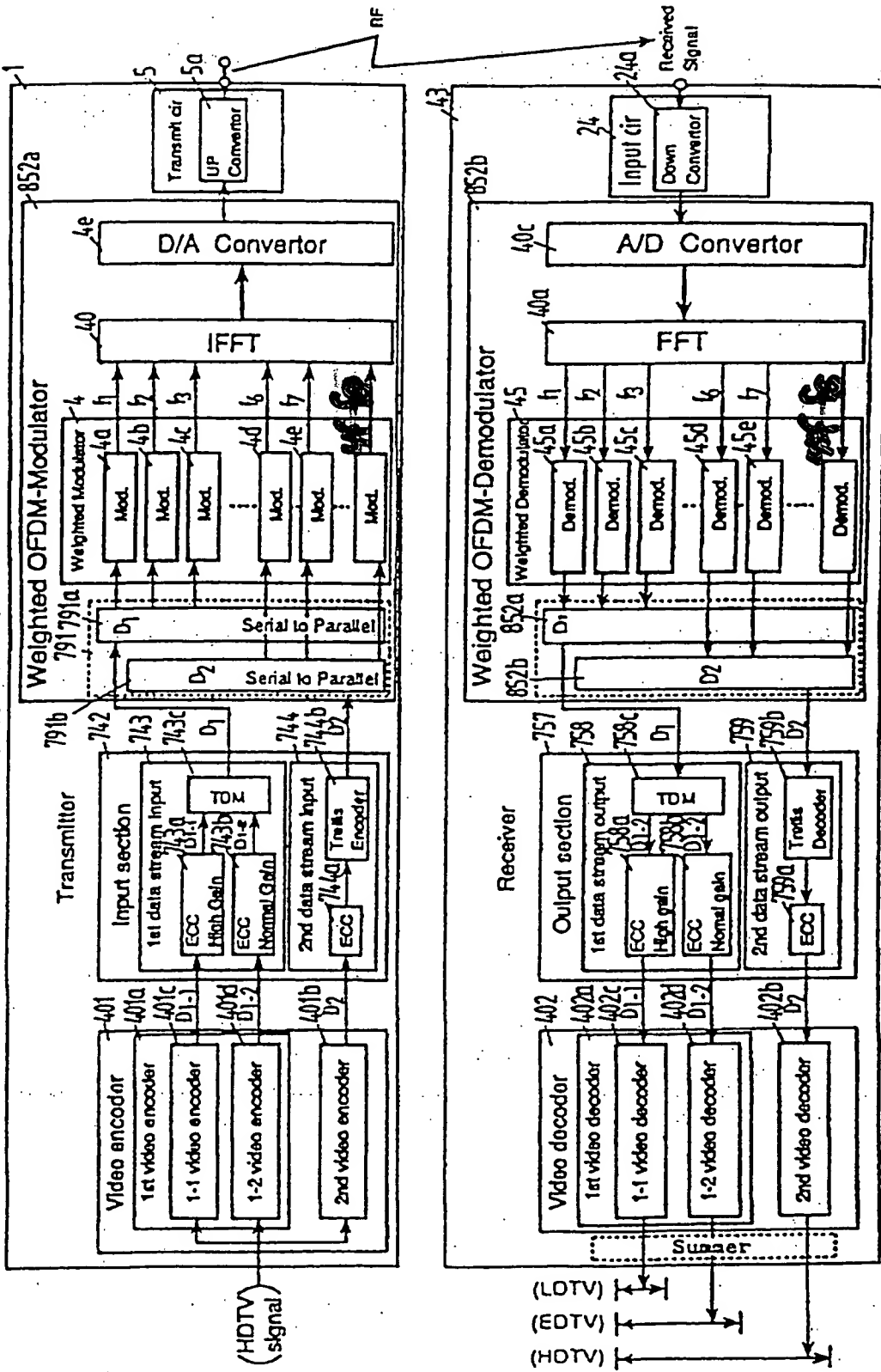
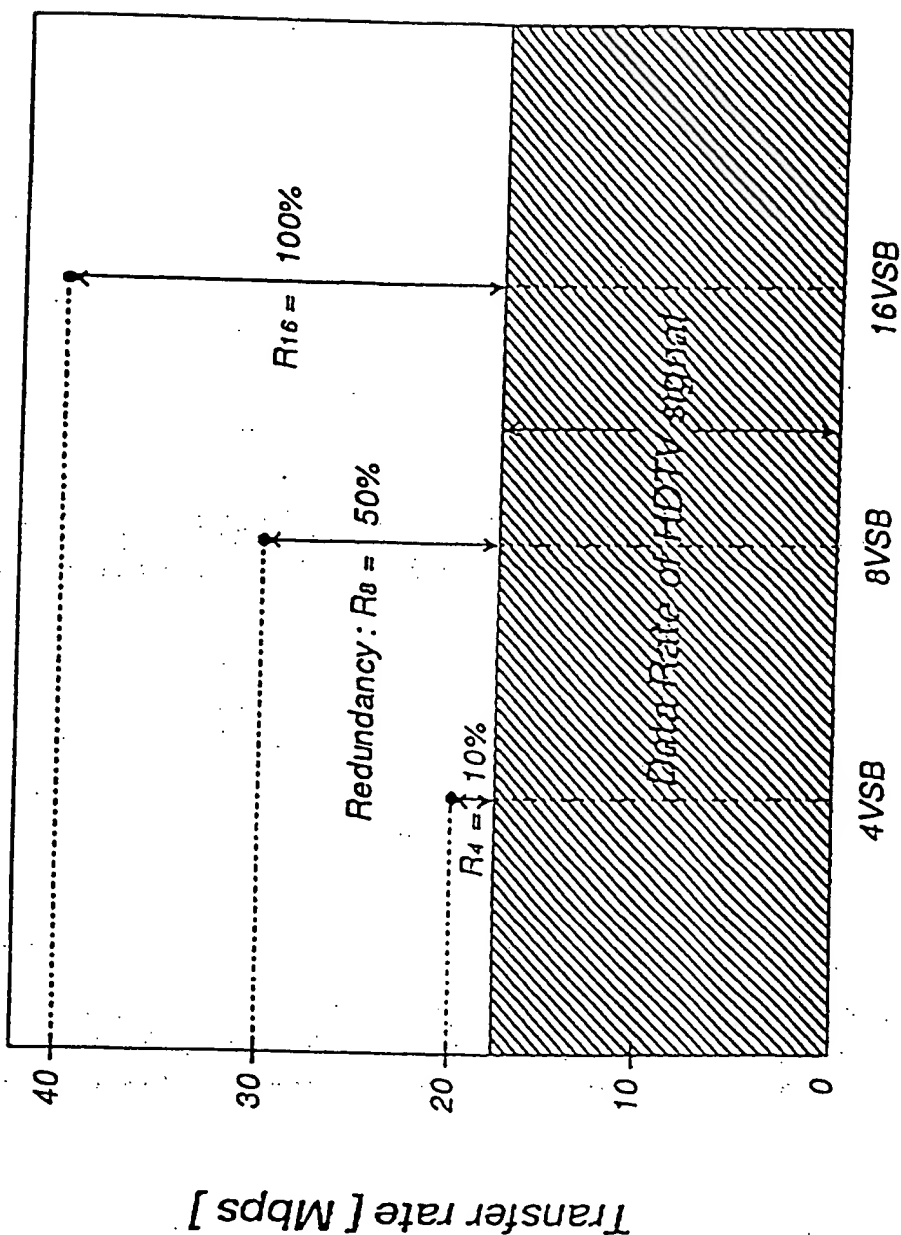


FIG. 144





*Comparison* **FIG. 169** *[Comparison] of Redundancy*



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109-23

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 2849**  
Mitsuaki OSHIMA : Docket No. 2000\_1727  
Serial No. 09/740,068 : Group Art Unit 2615  
Filed December 20, 2000 : Examiner R. Chevalier  
COMMUNICATION SYSTEM :

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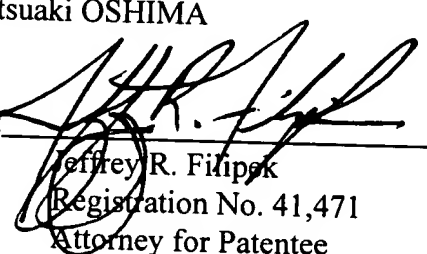
Sir:

Submitted herewith are 21 sheets of formal (8½ x 11) drawings (Figs. 10, 17, 24, 28, 29, 30, 32, 41, 42, 48, 65, 67, 71, 72, 78, 80, 82, 93, 124, 144, and 169) incorporating the changes included in the Letter Re Proposed Drawing Amendments filed concurrently herewith.

Respectfully submitted,

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October 2, 2003